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**XVI. *A Description of a petrified Stratum, formed from the Waters of Matlock, in Derbyshire. By Mathew Dobson, M. D. Communicated by Dr. Fothergill.***

Redde, Jan. 13, 1774. **D**URING a short stay at MATLOCK, this summer, I made some observations on the petrifying quality of the waters, and examined a very singular *Stratum*, which has been formed in their course.

This *Stratum* I found about 500 yards in length; in several places, near 100 yards in breadth; and, where thickest, from 3 to 4 yards in depth. The manner, in which this body of stone has been produced, is easily ascertained.

Within the memory of some persons now alive, the waters of Matlock were not appropriated to the purposes either of bathing or drinking. They issued from near the bottom of the hill, which lies to the west, immediately behind the present houses, and ran, at random, down a declivity of about 100 yards, to the river DERWENT. In their course, they formed large petrified masses, intermingled with great quantities of petrified moss, nuts, leaves, acorns, pieces of wood, and even trunks of trees.

The waters were thus constantly raising obstacles to their own progress, and were frequently therefore forced into new channels; so as, by degrees, to be extended over a surface of at least 500 yards in length. And, by being repeatedly returned into the same channels, a *Stratum*, of considerable thickness, has been formed.

On examining this *Stratum*, some parts are discovered to be extremely hard, and others so soft, as easily to be cut. The soft parts, however, on exposure to the air, become as hard as flint; and on being struck, sound like metal. The reason of this difference in the hardness of different parts, appears to be this: as the waters frequently changed their channels, and repeatedly likewise returned again to the same channels, if, in the intervals, there were any parts considerably raised, and consequently longer before they were covered with fresh incrustations, these, from a longer exposure to the air, would acquire a greater degree of hardness.

Whole houses, in the neighbourhood, are built of this stone, which they find more durable, than any other they meet with; and as it has the excellent property of growing harder, from being exposed, and has likewise many little cavities and interstices, good mortar so insinuates itself into these, as to form a wall as firm as one continued stone.

This *Stratum* affords very curious and beautifully varied petrifications. Moss exhibits great varieties; for it is evident, that the moss has continued to vegetate, after the roots and lower parts  
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had been penetrated by the stony particles; and thus, stretching itself to a considerable extent, it has, in some places, been mixed and interwoven with other substances. In some parts, snails have been arrested in their sluggish walks, and locked up in the stony concrete. In others, the petrifying matter has shot, in different directions, and formed an intricate kind of net-work. And in others again, there are large masses, which, on being broken asunder, are found hollow; and their cavities ornamented with branches of petrification, somewhat resembling coral, but of a darkish-white colour, and generally of a rough and granulated surface.

Under the *Stratum* there is, from a foot to a foot and a half, of good soil; and immediately under this lies the limestone rock. The soil is of the same nature with that of the adjoining fields, which form the slope of the hill, and is evidently a continuation of that soil.

Any further additions, to this petrified *Stratum* are now inconsiderable, and in many places none at all; for the two principal springs are confined to their channels, covered from the day, through the greatest part of their course, and are rapid in their motion.

Had proper observations been made on the progress of this *Stratum*, a tolerably exact estimate might have been formed, with respect to the time, when these waters were first impregnated with their mineral ingredients. From these two considerations, however, that the *Stratum* is not very thick, and that the soil, immediately under it, is a  
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continuation of that, which lies on the slope of the neighbouring hills, it is probable, that many centuries have not been requisite to its production; and, consequently, that these mineral waters are not of very antient date.

And, if we may rely upon an observation, which I had from a plain, inquisitive, and intelligent man, on the spot, the source, whence these waters derive their impregnation, is in some degree exhausted. This person assured me, from his own experience, that pieces of moss, and other substances, put in the course of the waters, and in the same circumstances as formerly, require more than double the time, for their petrification, that they did thirty years ago.

The *Stratum*, therefore, from which the Matlock waters are impregnated, must either be considerably exhausted; or the waters have deviated from their former course, and are now only partially distributed over this *Stratum*.

Liverpool, Oct. 15, 1773.